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GEOLOGY

of the

ISLAND CREEK
OIL POOL

By

WILLARD ROUSE JILLSON

Director and State Geologist



KENTUCKY GEOLOGICAL SURVEY

FRANKFORT, KENTUCKY

1927

The
**Kentucky Geological
Survey**

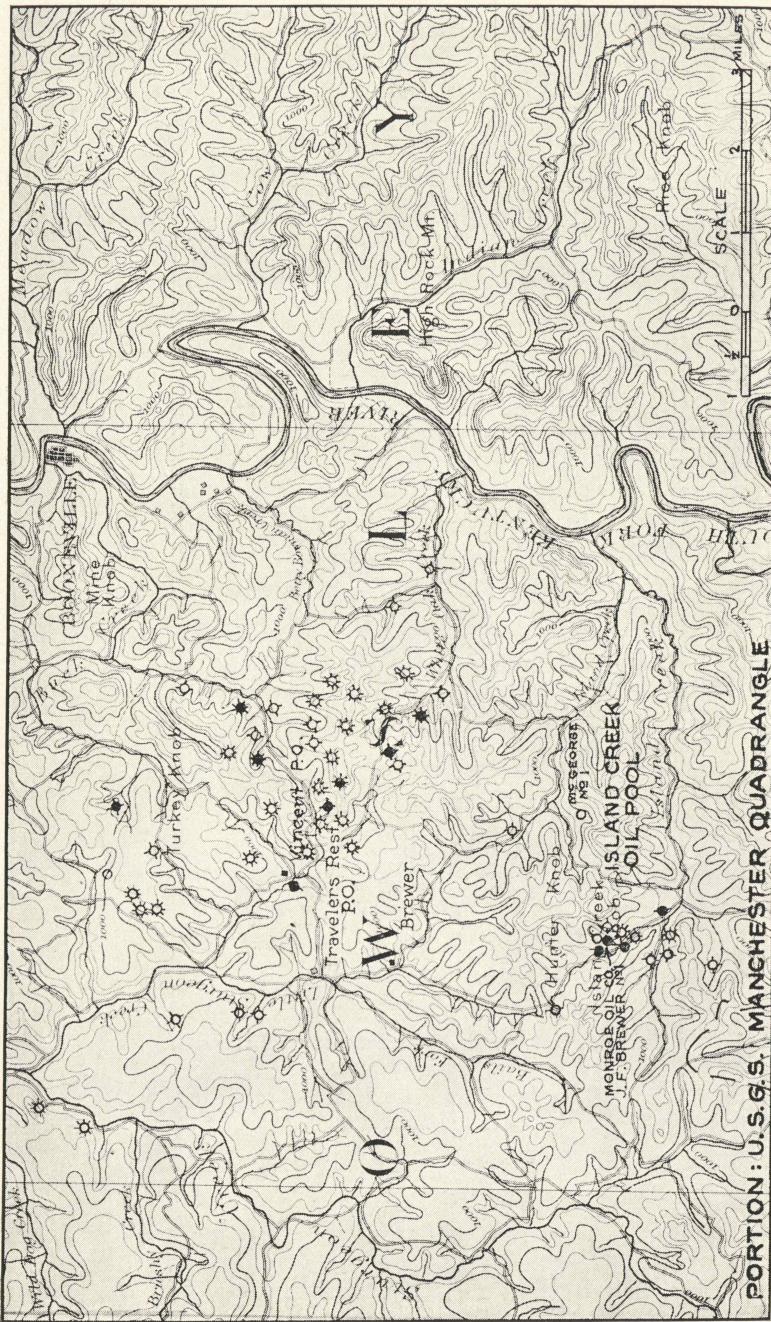
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SERIES VI
PAMPHLET XII

*Geology of the
Island Creek Oil Pool*

1927



TOPOGRAPHY OF SOUTHWESTERN OWSLEY COUNTY, KENTUCKY
Mature dissection is characteristic of this part of the State. Level bottom lands are very restricted and the hills exhibiting a general relief of about 250 feet are steep winding forested ridges. The roads follow the stream courses without exception.

GEOLOGY *of the* ISLAND CREEK OIL POOL

A Statement of Geological Conditions Attending
the Production of Petroleum and Natural
Gas in Southwestern Owsley
County, Kentucky

By
WILLARD ROUSE JILLSON
Director and State Geologist

Twenty Illustrations, Maps, and Diagrams

KENTUCKY GEOLOGICAL SURVEY
FRANKFORT, KENTUCKY
1927

Geology of the Island Creek Oil Pool

By

WILLARD ROUSE JILLSON, Sc. D.

Director and State Geologist
Of the Kentucky Geological Survey.

INTRODUCTION

The Island Creek Oil Pool is situated in Southwestern Owsley County, Kentucky, in the central western part of the Eastern Kentucky coal field. It is located fifteen miles in an air line slightly west of south of Beattyville, and twenty miles in an air line slightly west of south of the Big Sinking Oil Pool in northern Lee County. It is about sixty-three miles southeast of Lexington, Kentucky. The territory is reached by the Louisville and Nashville railroad from central Kentucky to Beattyville. From this point new State graded and drained, and unimproved county roads lead to Booneville, the county seat of Owsley County. Booneville is located on the South Fork of the Kentucky River nine miles in an air line to the northeast of Upper Island Creek. Another and shorter route goes by Levi postoffice over Elk Lick, Buck Creek, and Brewers on Sturgeon Creek.

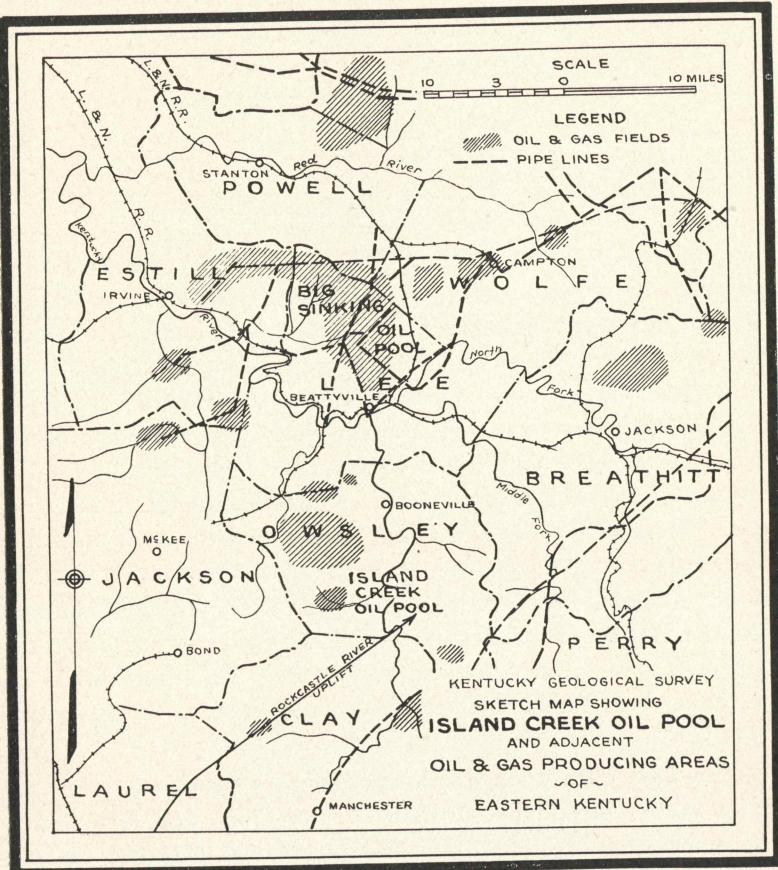
The field work upon which this report is based was executed by the writer, personally, on February 9th, 10th, and 11th, 1927. The report is published so that all who may be interested in the development of this new district may have such geological, oil and gas producing, and other data of a reliable nature as are now available. In preparing this brief report the writer has felt the loss of much information, particularly well records which should have been available for this field. These would have allowed a more accurate and detailed conception of subsurface conditions, particularly in close proximity to the producing sand.

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PHYSIOGRAPHY AND GEOLOGY

The Island Creek Oil Pool is located upon and drained by the headwaters of upper Island Creek, an eastward flowing tributary of the South Fork of the Kentucky River. The physical relief in this vicinity varies from a minimum of about fifty



GEOGRAPHIC LOCATION ISLAND CREEK OIL POOL

feet to a maximum of about 425 feet. The rocks exposed at the surface consist of a series of Coal Measures (Pennsylvanian) sandstones, shales and coals. The upper subsurface rocks are a downward continuation of these surface sediments coupled with some sandstone conglomerates at or near the base. These

conglomerates are penetrated by the drill at depths varying from about 300 to 350 feet.

The bottom of the Coal Measures is seen in the record of the J. F. Brewer No. 1 well, and is found at a depth of about 500 feet. It is underlain by a series of limestones, sandstones, and shales, about 650 feet in thickness, which constitute the Mississippian System of rocks in this vicinity. The upper part of these Mississippian rocks is composed of four limestones: The Glen Dean, Gasper, Ste. Genevieve, and St. Louis. These beds are recognized by drillers as the "Little Lime" and the "Big Lime," two separate and easily distinguishable formations. The upper is very oolitic, while the lower is cherty, compact or crystalline. Lower formations are indicated in the following table:

GEOLOGICAL SUBDIVISIONS OF OWSLEY COUNTY, KENTUCKY

System	Series	Formations
Recent	Fluviatile	Alluvial sand, clay and gravels.
Pennsylvanian	Pottsville	Sandstones, sandstone conglomerates, shales and coals.

DISCONFORMITY

Mississippian	Pennington	Sandstones, shales and limestone.
	Chester { Glen Dean Ste. Genevieve St. Louis	Thick limestone with thin beds of shale and shaly sandstone, the "Big Lime" of drillers.
	Waverly	Gray green shales and sandstones.
	(New Providence)	Green shale and thin sandy and calcareous beds intercalated.

DISCONFORMITY

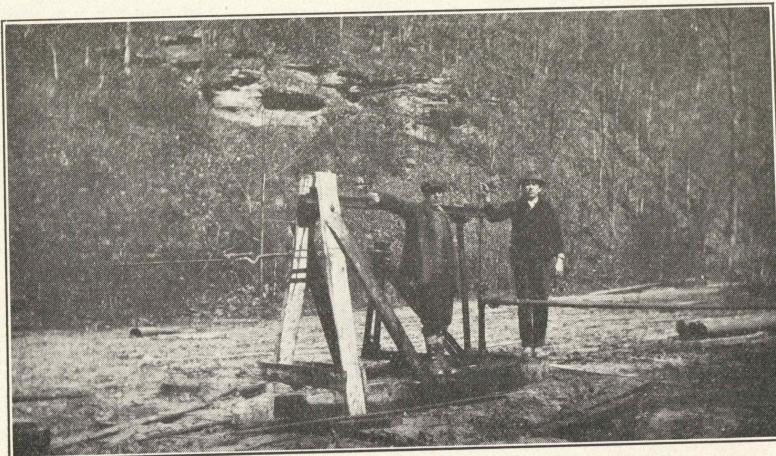
Devonian	Upper "Chattanooga"—"Ohio"	Black fissile shale.
	Middle "Onondaga"—"Hamilton"	Dolomitic cherty limestone, the "Corniferous or Irvine" sand of drillers.

DISCONFORMITY

Silurian	Middle	Limestones and shales, gray, green and red.
	"Niagaran"	

DISCONFORMITY		
	Upper "Cincinnatian"	Limestone, shales and sandstone.
DISCONFORMITY		
Ordovician	Middle "Champlainian"	Limestones, granular and compact.
DISCONFORMITY		
	Lower "Canadian"	Limestones, magnesian and siliceous.

Note.—With the exception of recent alluviums along the streams and the upper half of the local Pottsville section, all of the sedimentary rocks tabulated above are found below drainage in the Island Creek region of Owsley County, Kentucky. Lower Cretaceous quartzite pebbles carrying in many instances *Scolithus* borings and found widely distributed in Eastern Kentucky, have not been entered in this stratigraphic tabulation as none have been found in Owsley County to date though they may be present.



J. F. BREWER NO. 1, ISLAND CREEK POOL

This well was brought in flowing Nov. 16, 1926, by the Monroe Oil Co., of Beattyville, Ky. Its casing head is 743 feet above the productive oil sand.

The oil producing "sand" in the J. F. Brewer No. 1 well has been designated by drillers as the "Big Injun." Positive identification is as yet uncertain. It occurs beneath a pronouncedly caving shale, designated by the drillers as "Pencil Cave." It is not, however, the true "Pencil Cave" of West Virginia, which would come here somewhat higher in the Mississippian stratigraphic section. The caving shale in the J. F. Brewer No. 1 well, occurs at a depth of 715 feet in this locality as evidenced by the log of this well. The principal overlying forma-

tion above the producing "sand" is the limestone known as the "Big Lime" (Mississippian) which was found to be 148 feet in thickness in this well. The limestone found just above the oil "sand" is both oolitic and compact. It is basal Ste. Genevieve and St. Louis. The thin green "caving" shale following might be the "break" above the Warsaw member known as the Garrett Mill Conglomerate in Jackson and Rockcastle counties, but a lack of information as to what occurs in the first 100 feet beneath the oil "sand" renders present correlations purely conjectural.

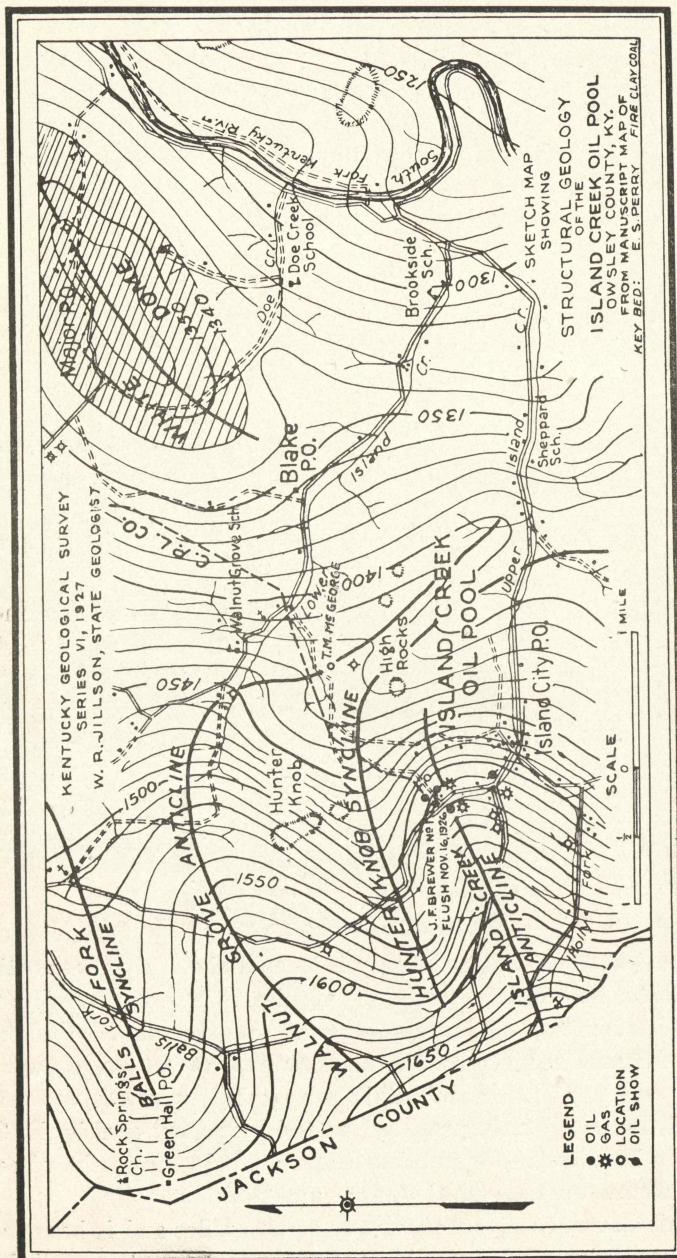
The "Big Injun" producing sand was encountered at a depth of 743 feet in the J. F. Brewer No. 1 well, as evidenced by the record of this well which is herewith attached. Due to the fact that this well was brought in as a strongly flowing oil producer, no samples of the "Big Injun" sand were recovered. It is therefore impossible to discuss this sand in this well adequately at the present time. The "Big Injun" sand in the outcrop has been correlated with the Wildie sandstone which is basal Warsaw (Mississippian).

Subjacent to the "Big Injun" sand is a series of sandstones and shales in the lower Mississippian division exhibiting a thickness of about 400 feet. Beneath these formations is found the Chattanooga (Devonian) black shale, which is underlain by the "Corniferous" (Devonian) oil "sand." The "Corniferous" is the principal oil producing "sand" of the "Big Sinking" region of Lee County, Kentucky, and is found at a depth of from 550 to 600 feet below the "Big Injun" sand. This sand has not been penetrated in the J. F. Brewer well No. 1.

STRUCTURAL GEOLOGY

Southwestern Owsley County is located about 10 miles northwest of the Eastern Kentucky geo-syncline. The normal dip of the subsurface rocks is, therefore, to the southeast. The Island Creek Oil pool exhibits restricted anticlinal structure plunging to the east and northeast. This is revealed by the structural map of Owsley County prepared on the Fire Clay coal by E. S. Perry in 1926, and now published and available from the offices of the Kentucky Geological Survey at Frankfort.

This structure covers about two square miles and is bounded on the north by the Hunter Knob Syncline and on the south by



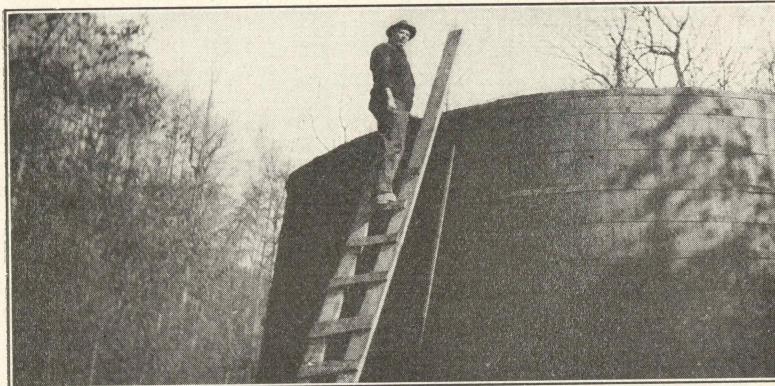
the Holly Fork Syncline, each pronounced depressional areas. These synclines join in a basin syncline on Becklin Branch near Spivey School. The northeast flank of the Island Creek Anticline is so pronounced as to be easily seen in the surface rocks, and is well illustrated in the accompanying photograph taken on the H. D. Peters farm, near the J. F. Brewer line on upper Island Creek.

OIL AND GAS DEVELOPMENT

The largest well in the Island Creek Oil pool is the J. F. Brewer No. 1 which was brought in by the Monroe Oil Co., flowing flush November 16, 1926. This well is located on the northeastern flank of the anticline underlying the pool, and is but two locations distant from a small oil and gas well drilled higher on this structure on the H. D. Peters farm somewhat previously. The writer was not present at the time the Brewer well was brought in, but witnesses both natives and professional oil men who watched the drilling state that the oil gushed from the well above the mast to a height of about 70 or 80 feet. It is reported to have risen as a solid stream and then to have sprayed out umbrella like in falling. The oil flowed down Island Creek and the South Fork of the Kentucky River into the main Kentucky River at Beattyville, and many miles down stream. It is reported to have been seen at Frankfort.

Various estimates ranging between ten and twenty thousand barrels have been made as to the loss of oil during this uncontrollable flowing period which continued for about 48 hours following the drilling in of the well. This unusual producer, however, was finally closed in and drilled sixteen feet deeper to a total depth of 759 feet as substantiated by the record of this well secured from the driller and submitted herewith.

On February 1, 1927 the Cumberland Pipe Line Company undertook a ten days' official test of this well with their guager, Mr. J. B. Sparks, on the ground. The well was pumped on an alternating 12 hour "tower," and was gauged every 3 hours by Mr. Sparks. Resulting from this gauging, as is shown herewith, a total of 579.84 barrels of oil was secured. The well produced no water and no gas, a fact which the writer is able to verify by personal observation. Statement of this test follows:



STORAGE ON BREWER TRACT

This 1,600 barrel tank was used for the test made by the Cumberland Pipe Line Company, February 1st to 10th, 1927. M. Ashley on ladder.

PUMPING TEST, J. F. BREWER NO. 1 WELL

Upon the request of the Monroe Oil Company, Beattyville, Ky., we give below the result of our ten day test of their No. 1 Brewer well, located at Island City, Ky., as furnished by our gauger, Mr. J. B. Sparks:

PUMPED				1st Mst.	2d Mst.	Total Ins.	Bbls.
Date	From	To	Time				
2/ 1/27	9:45 A. M.	5:15 P. M.	7:30	2' 6½"	2' 11¼"	4¾"	40.38
2/ 2/27	7:00 A. M.	7:30 P. M.	12:00	2' 11¼"	3' 6¼"	7"	58.98
2/ 3/27	6:40 A. M.	7:30 P. M.	11:50	3' 6¼"	4' 1¼"	7"	58.70
2/ 4/27	7:00 A. M.	7:00 P. M.	12:00	4' 1¼"	4' 8¼"	7"	58.24
2/ 5/27	6:30 A. M.	6:30 P. M.	12:00	4' 7¾"	5' 2¾"	7"	57.90
2/ 6/27	6:30 A. M.	6:30 P. M.	12:00	5' 2¾"	5' 9¾"	7"	57.41
2/ 7/27	6:40 A. M.	7:10 P. M.	11:20	5' 9¾"	6' 4"	6¾"	55.15
Down 1 hr. 10 min.							
2/ 8/27	7:00 A. M.	7:00 P. M.	12:00	6' 4"	6' 11¾"	7¾"	62.82
2/ 9/27	6:30 A. M.	6:30 P. M.	12:00	6' 11¾"	7' 7"	7¼"	58.30
2/10/27	6:50 A. M.	6:50 P. M.	12:00	7' 6½"	8' 3½"	9"	71.96
Total.....							579.84

(Signed) Jos. A. GEIGER,
Gen'l Supt. Cumberland Pipe Line Co., Inc.

Winchester, Ky.

Feb. 15, 1927.

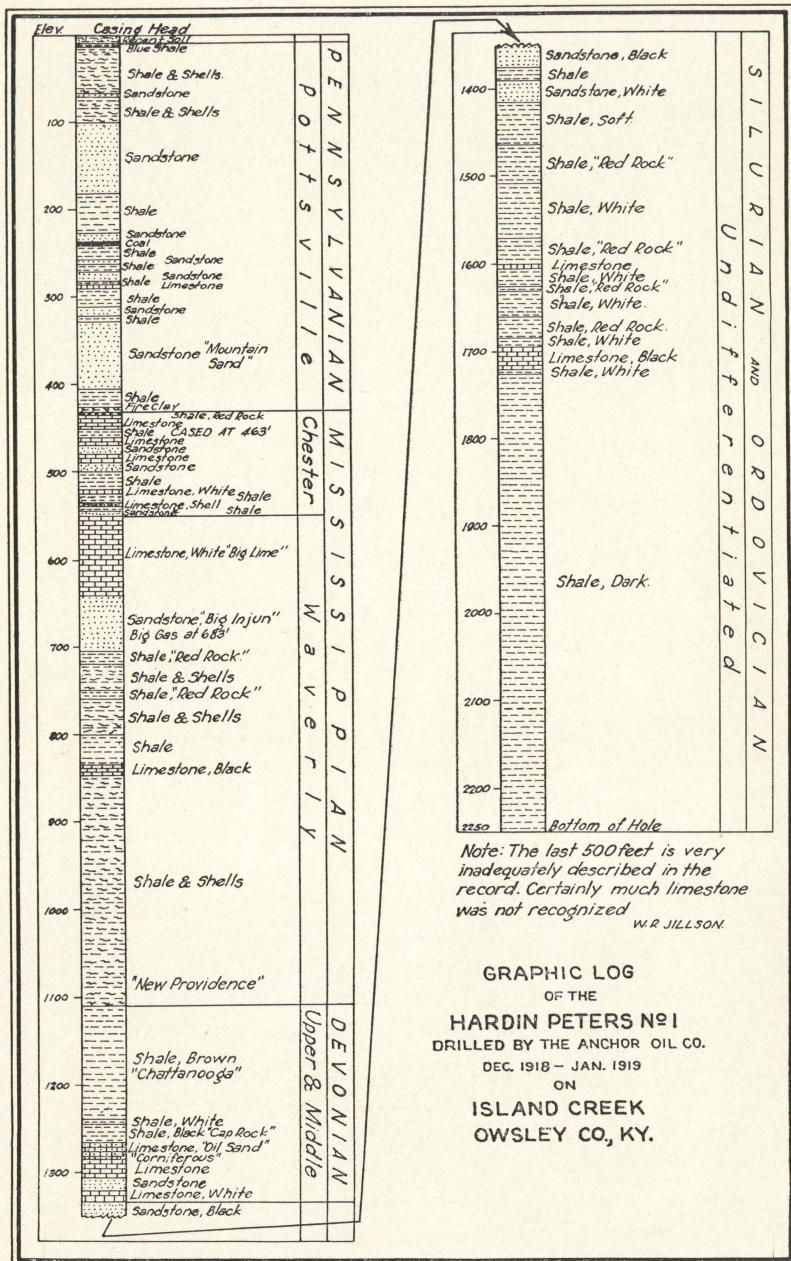
During the first nine days of the test a sixteen inch stroke on the pump (Oklahoma jack) was used. The stroke was increased on the 10th day. Comparison of the production secured on February 1st, which was the first day, namely, 40.38 barrels, as against that secured on the 10th of February, or last day, namely 71.96 barrels is interesting. It was the writer's personal opinion given on the ground that this well was never completely pumped off during the testing period. A study of the flow indicated this to be a fact. The same conclusions may be obtained by a critical consideration of the official testing record as given above.

Taking the Cumberland Pipe Line Company's test of 579.84 barrels for the ten day period one secures a 12 hour daily production of 57.98 barrels. (The record is accepted on a basis of 120 pumping hours, but in reality was only about 114 hours in duration.) A 24 hour daily production of oil would therefore be twice this amount, or 115.96 barrels. The increase of production on the tenth day as compared with the production on the ninth day is about 13 barrels. It appears that 71.96 barrels may now be safely taken as the gauge of a 12 hour pumping tower on this well. Subsequent oil runs may in fact show this opinion to have been conservative.

Confirmatory to this calculation of production, the J. F. Brewer No. 1 well is reported by Monroe McGuire, F. M. Ashley, and Virgil Beatty to have pumped from the beam of the drilling rig a measured 210 barrels during a 23 hour unofficial test. This test was made prior to the moving of the rig away from the well, and before the gauging reported by the Cumberland Pipe Line Company. It is the writer's opinion that this well may be safely rated at the present time as good for about 155 barrels daily, and that it might now (March 1, 1927) easily produce 200 barrels daily if put back on the beam.*

Prior to the drilling of the J. F. Brewer No. 1 well in the Fall of 1926, six wells had been drilled for oil and gas on Upper

*Since the writing of this report drilling in the Island Creek pool has resulted in a dry hole on the Tom McGeorge, a small gasser in the H. D. Peters No. 3, and a flowing oil well in the J. F. Brewer No. 2, the latter coming in unexpectedly July 2, 1927. The Petroleum Exploration, Inc., J. F. Brewer No. 1, came in a flowing oil well August 6, 1927, and the Big Injin Oil Co., J. F. Brewer No. 3, came in a good oil well on August 9, 1927. The Atlantic Oil Producing Co. is now drilling the D. Chadwell. Logs of all have been added to this report. The Petroleum Exploration, Inc., No. 1. J. F. Brewer was reported on August 20 to be making 125 barrels a day without change.



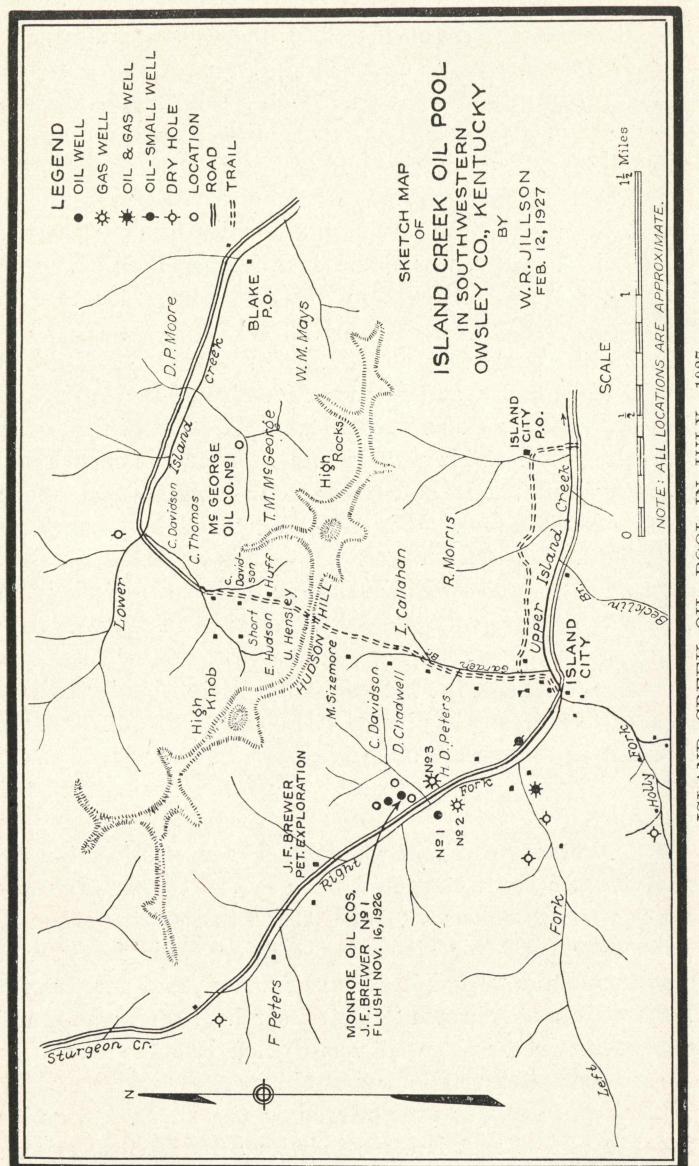
H. D. PETERS NO. 1, FIRST WELL ON UPPER ISLAND CREEK

Island Creek. Four of these had been drilled close to the mouth of the Left Fork by the Anchor Oil Company during 1918 and 1919. The first of these on the H. D. Peters lease is located east of Upper Island Creek. It produced, according to report, a good deal of fluid and some gas. The second, drilled just back of the house of Emory Peters on the Left Fork produced, it is said, considerably more gas and a little oil. Two additional wells drilled further up the Left Fork were dry and were plugged. The field not appearing attractive at that time to the Anchor Oil Company, was abandoned. Graphic log of the H. D. Peters No. 1 is presented here with the comment that the lower part of the record was very imperfectly reported.

During the past two years Dr. J. N. Sebastian and others of Louisville, Kentucky, and Monroe McGuire of Beattyville, Kentucky, acquired the H. D. Peters lease and drilled in October 22, 1925 their No. 1. This well is located near the mouth of the branch on which the large Brewer well is located, 200 feet from the Peters-Brewer line. It is shown in one of the accompanying photographs. The H. D. Peters No. 1 is reported by Dr. Sebastian to have produced about 25 or 30 barrels of oil per day after a several days pumping test. Very little gas was encountered in the No. 1 well and although unfortunately no record of the drilling was kept, the bottom of the "Big Lime" was passed according to statements given Dr. Sebastian at 701 feet. This well was used to fuel the drilling of the H. D. Peters No. 2 and is reported by the owners to have improved during this period of pumping.

H. D. Peters No. 2 well was drilled then, one location to the southeast down the waters of Upper Island Creek. It came in as a gas well December 31, 1925, and was reported when flush to have been good for about two million cubic feet per day. The bottom of the "Big Lime" was 696 feet, and gas was found at 709 feet in a soft brown "sugar" sand. No oil was found at this horizon. Later the well was drilled into the Corniferous, where it produced a small show of oil.

When the gas was encountered in the H. D. Peters No. 2 at a depth of 709 feet it came in with a terrific explosion and igniting from the forge burned an uncontrollable flame reported by Dr. Sebastian to have been at least 75 feet high. Continuous work for seven hours by the driller and other workmen im-



pressed into the undertaking, finally succeeded in cutting off the flame by the use of live steam in a flattened length of casing. The drilling rig was destroyed by fire. Another rig was procured and moved to the location within a few days and this well was then completed as indicated above, to a greater depth. The Island Creek pool thus had two gas wells producing for domestic purposes and one oil well, closed in prior to the drilling of the J. F. Brewer No. 1 in the fall of 1926.

At points more distant, additional drilling had been done. Late in 1925, Beamer and Son of Clay City, drilled in a dry hole on the Dan Peters lease at the head of the Right Fork of Upper Island Creek. A dry hole on the lower waters of Holly Fork was drilled in a short time previously. Another dry hole is also reported on the head of the Left Fork of Island Creek. A small oil well was drilled in on Lower Island Creek in 1926, about 1 1/2 miles above Blake postoffice by Beatty and McGuire, of Beattyville, Kentucky. Each of these wells are unfortunately of little use in interpreting the field, as no accurate drilling records were kept. They are of considerable value, however, in indicating the probable productive delimitation of the new Island Creek pool to the north, northwest, west and southwest. Based on the existence of the delimiting dry holes, operators conversant with field conditions, are now unanimous in their opinion that extensions of this pool will probably be made to some undefined distance to the east, northeast and northwest.

OIL RUNS

Shortly after the completion of its test of J. F. Brewer No. 1 well early in February, 1927, the Cumberland Pipe Line Company began the work of constructing a new 2 inch pipe line from its Ida May (Lee County) station to the new Island Creek field. A wet spring operated to retard this work considerably, but the line about twelve miles in length and the pump station situated at the mouth of Oil Branch of upper Island Creek was completed during the latter part of June and was tested early in July, 1927. Oil runs were then immediately begun from the J. F. Brewer No. 1 and No. 2 wells and from tank storage produced from these wells, then standing on this lease. Oil runs for the first twenty two days, July 8 to July 30, 1927 inclusive, are given herewith. These show a production of 189.11 barrels

per day, the runs being based upon a twelve hour pumping tower.



CUMBERLAND PIPE LINE CO. PUMP HOUSE

This station with about 12 miles of two-inch oil line to Ida May represents new installation. Oriole Jillson at the left.

CUMBERLAND PIPE LINE COMPANY
OIL CITY, PA.

Statement of the account of Big Injun Oil Co., on
J. F. Brewer, 50 Acre Farm.

	1927		1927
July 8th	\$85.03	" 19th	83.41
	85.42		86.80
" 9th	319.42	" 20th	86.60
	351.46		71.39
" 10th	85.81	" 23d	86.60
	80.89		85.22
" 12th	84.24		83.65
	86.01		83.57
	85.62		83.65
" 13th	87.00	" 25th	85.62
	85.81		78.04
	86.80		80.49
" 14th	86.80		85.42
	86.21	" 26th	86.80
	85.81	" 28th	84.24
" 16th	84.04		84.04
	86.21	" 29th	83.45
	85.42	" 30th	82.07
	85.22		61.27
" 17th	87.00		
	86.21	Total	\$4,098.94
	79.70		*61.48
" 18th	86.21		
	74.27		**\$4,160.42

*1½% State and county tax not included.
**Average for 22 days' run—189.11 bbls.

ANALYSES

Four analyses of samples of petroleum secured from this unusual oil pool in Owsley County have been made by Dr. A. M. Peter, State Chemist. The analyses show that the oil produced from the J. F. Brewer lease is a high grade petroleum ranging from 38° to 40.8° Baume gravity. Field tests by hydrometer on samples direct from the well generally show from 41° to 42° Baume. Oil from the higher sand in J. F. Brewer No. 2 (Big Injun Oil Co) is not as light as that found in all three of the wells producing from the lower sand. It is almost an ideal lubricating-gasoline petroleum. The analyses are attached herewith:

Feb. 18, 1927.

Laboratory G-4269-Petroleum, received February 16, 1927, from Dr. W. R. Jillson, labeled as follows: "Petroleum, from Upper Island Creek, 1 mile northwest of Island City, Ky., from farm of J. F. Brewer No. 1, "Big Injun" sand. Lessee, Monroe Oil Company, Depth 743 feet. Flush, Nov. 16, 1926, flowing several M. bbls. Collected by W. R. Jillson, Feb. 10, 1927.

Specific gravity, .8195 = 40.8° B.

Per cent. by volume.

Distillate below 150° C. (302° F.)	19.2	Gasoline fraction
Distillate 150°-300° C. (302-572° F.)	31.5	Burning oil fraction
Thick greenish oil	46.0	
Loss in distilling	3.3	

100.0

The loss in the distillation is more than it should be, but we did not have enuf of the sample left for another test. Presumably most of the loss was from the gasoline fraction.

(Tests by A. M. Peter.)

A. M. Peter, Chief Chemist.

August 12, 1927.

Laboratory No. G-4278.—Petroleum, labeled "Petroleum Exploration, Inc., No. 1 (J. F. Brewer lease), 810 + 20 ft. Collected by W. R. Jillson, August 9, 1927. Sample taken from the well. Big Injun Sand." A thin, green oil, dark brown by transmitted light.

Specific gravity .8270 = 39.3° B.

Per cent by volume.

Distillate below 150° C. (302° F.)	18.5	Gasoline fraction
Distillate 150-300° C. (302-572° F.)	32.0	Burning oil fraction
Thick, green-brown oil	47.5	
Loss	2.0	

100.0

(Test by A. M. Peter)

A. M. Peter, Chief Chemist.

August 12, 1927.

Laboratory No. G-42479.—Petroleum, labeled "J. F. Brewer No. 2, Big Injun Oil Co., Island Creek, Owsley County, Ky. Collected by W. R. Jillson, August 9, 1927. Sample taken from the well (Big Injun Sand)." Thin, green oil, dark brown by transmitted light.

Specific gravity .8328 = 38.1° B.

Per cent by volume.

Distillate below 150° C. (302° F.)	16.8	Gasoline fraction
Distillate 150-300° C. (302-572° F.)	33.0	Burning oil fraction
Thick, green-brown oil	49.5	
Loss	0.7	
Total	100.0	

A. M. Peter, Chief Chemist.

(Tests by A. M. Peter)

August 12, 1927.

Laboratory No. G-4280.—Petroleum, labeled "From J. D. Brewer No. 3 of Big Injun Oil Co., collected fresh from the well as well was brought in—W. R. Jillson, August 9, 1927. Big Injun Sand." Thin green oil, dark brown by transmitted light.

Specific gravity .8285 = 39.° B.

Per cent by volume.

Distillate below 150° C. (302° F.)	19.0	Gasoline fraction
Distillate 150-300° C. (302-572° F.)	33.0	Burning oil fraction
Thick green-brown oil	46.5	
Loss	1.5	
Total	100.0	

(Tests by A. M. Peter)

A. M. Peter, Chief Chemist.

WELL RECORDS

Unfortunately few reliable well records are available for the Island Creek pool although a number of wells have been drilled for oil and gas in this part of Owsley County, Kentucky. Such logs as could be gotten together are presented herewith. All of them have been edited and revised by the writer so as to show in a general way the subsurface stratigraphy. Besides these there are presented here several additional logs for adjacent parts of Owsley, Jackson and Clay Counties, Kentucky. The log number given here corresponds to the regional map accompanying this report.

OWSLEY COUNTY

WELL LOG No. 1.

J. F. Brewer No. 1, lessor. Monroe Oil Co., lessee. Location: On a small southwest flowing branch of right fork of Upper Island Creek.

GEOLOGY OF THE ISLAND CREEK OIL POOL

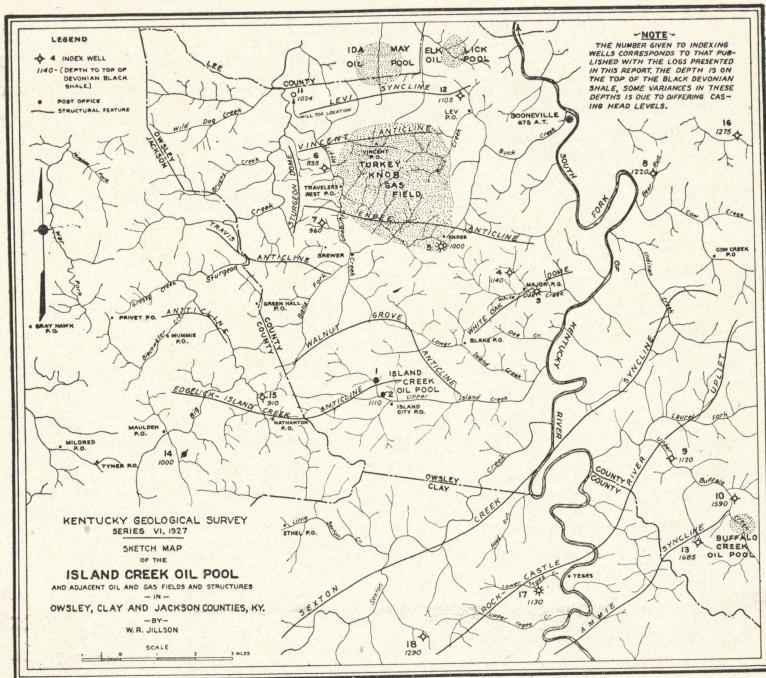
One mile northwest of Island City, Owsley County, Ky. Commenced: October 30, 1926. Completed: November 16, 1926. F. M. Ashley, driller. Wm. Moore, tool dresser. Island City, Ky. Drilled flush November 16, 1926. Flowed uncontrolled, estimated 15-20 M. bbls. for 48 hours. Pumped by test February 1, 1927, February 10, 1927, as indicated below. Log revised by W. R. Jillson, February 14, 1927.

Strata	Thickness	Depth
RECENT		
Soil and clay (drive pipe)	40	40
PENNSYLVANIAN SYSTEM		
Sandstone	90	130
Sandstone "Salt Sand"	50	180
Coal vein	7	187
Shale	12	199
Sandstone "Salt Sand"	93	292
Shale	56	348
Sandstone "Salt Sand"	28	450
Shale and limestone	56	506
MISSISSIPPIAN SYSTEM		
Limestone, "Little Lime"	28	534
Limestone, black	28	562
Shale, black	5	567
Limestone, "Big Lime"	148	715
Shale "Pencil Cave"	1	716
Limestone, brown (oil flowing flush)	27	743
Limestone	16	759
Total depth		759 feet

Note: Pumping Record: Cumberland Pipe Line Test, 1600 bbl. tank. Beginning at 2 feet 6 1/2 in. February 1, 1927. Completed at 8 feet 3 1/2 in. February 10, 1927. This pumping test filled the tank 5 feet 9 inches in ten days by gauger's record. The total number of barrels pumped was 579.84, using "Oklahoma jack" and a 16 inch stroke on a 12 hour daily alternating tower. Computed on this basis a 24 hour pumping would show 1,159.68 barrels. This daily production could undoubtedly be greatly increased by lengthening the stroke of the pump from 16 to 20 or 22 inches as this well under official gauging of the Cumberland Pipe Line Co. gauger, Mr. J. B. Sparks, produced 40.38 bbls. February 1, 1927, and 71.96 bbls. February 10, 1927, indicating that it was actually never completely pumped off.

WELL LOG No. 2.

Hardin Peters No. 1, lessor. Anchor Oil Co., lessee. Location: Right Fork, Upper Island Creek, Owsley County, Kentucky. Com-



INDEXING WELLS ISLAND CREEK POOL AND VICINITY

menced: December, 1918. Completed: February, 1919. Authorities: Petroleum Exploration, and Eastern Gulf Oil Co.

Strata	Thickness	Depth
RECENT		
Soil	8	8
PENNSYLVANIAN SYSTEM		
Shale, blue	4	12
Shale and shells	55	67
Sandstone	4	71
Shale and shells	29	100
Sandstone	80	180
Shale	45	225
Sandstone	10	235
Coal	3	238
Shale	17	255
Sandstone	5	260
Shale	10	270
Sandstone	10	280
Shale	5	285

Strata	Thickness	Depth
Sandstone	5	290
Shale	20	310
Sandstone	10	320
Shale	7	327
Sandstone	78	425
Fire Clay	5	430
MISSISSIPPIAN SYSTEM		
Shale "Red Rock"	3	433
Limestone	17	450
Shale	10	460
Limestone	10	470
Sandstone	20	500
Shale	20	520
Limestone white	5	525
Shale	10	535
Limestone, shell	3	538
Shale	5	543
Sandstone	7	550
Limestone, white	90	640
Sandstone, "Big Injun"—Gas	683	705
Shale, "Red Rock"	15	720
Shale and shells	30	750
Shale, "Red Rock"	10	760
Shale and shells	40	800
Shale	35	835
Limestone, black	10	845
Shale and shells "Waverly"	265	1110
DEVONIAN SYSTEM		
Shale, brown "Chattanooga"	130	1240
Clay, white	5	1245
Shale, black "Cap Rock"	20	1265
Limestone, "Oil sand"	20	1285
Limestone, salt water	20	1305
Sandstone	15	1320
Limestone, white	15	1335
SILURIAN SYSTEM		
Sandstone, black	40	1375
Shale	15	1390
Sandstone, white	25	1415
Shale, soft	50	1465
Shale, "Red Rock"	45	1510
Shale, white	60	1570
Shale "Red Rock"	30	1600
Limestone	5	1605
Shale, white	20	1625

Strata	Thickness	Depth
Shale, "Red Rock"	5	1630
Shale, white	30	1660
Shale, "Red Rock"	25	1685
Shale, white	10	1695
Limestone, black	25	1720
Shale, white	5	1725
Shale, black	525	2250
Total depth		2250 feet

Big Gas at 683 feet. Cased at 463 feet.



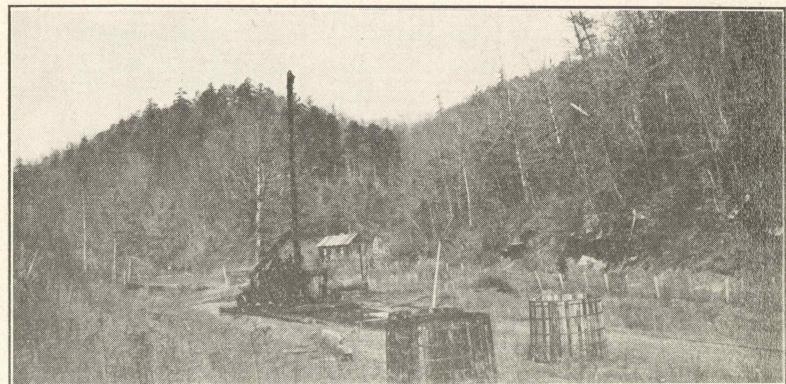
ATLANTIC OIL PRODUCING CO. RIG ON LOCATION

This drilling location is on the ridge on the David Chadwell lease close to the J. F. Brewer line. Monroe McGuire original prospector in the Island Creek field at the right, Aug. 9, 1927.

WELL LOG No. 3.

H. D. Peters, No. 3, lessor. Dr. J. N. Sebastian, et al., 1801 W. Broadway, Louisville, Ky., lessees. Location: Upper Island Creek, Owsley County, Ky. Drilled April 17, 1927. Production: Gas.

Strata	Thickness	Depth
RECENT		
Soil	4	4
PENNSYLVANIAN SYSTEM		
Sandstone, gray	35	39
Shale and shells	40	79
Sandstone, dark	45	124
Shale, black	176	300
Sandstone, white	35	335
Shale, black	80	415
Sandstone, "Salt Sand"	85	500



OIL WELL AND TANKS

In the foreground is the H. D. Peters No. 1 well drilled by Messrs. Sebastian, Jones and others of Louisville, and McGuire of Beattyville, Kentucky. This well was a good oil producer. The J. F. Brewer lease is seen in the distance.

Strata	Thickness	Depth
Coal	5	505
Shale and lime shells	41	546
Sandstone, "Salt Sand"	59	605
Shale and lime shells	43	648
Fire clay	6	654
Shale, black	3	657
Sandstone, black	23	680
Shale and lime shells	26	706

MISSISSIPPIAN SYSTEM

Shale, black	46	752
Limestone, "Little Lime"	52	804
Shale, gray	6	810
Limestone, "Big Lime"	98	908
Limestone, "Keener Sand"	9	917
Shale, green, sandy	35	952
Sandstone, brown "Big Injun"	8	960
Shale, green, sandy	15	975
Sandstone, brown, "Big Injun"	5	980
Shale, green, sandy	29	1009

Total depth

Authority: Geo. H. Schroer, Island City, Ky.

WELL LOG No. 4.

Bowen Pendergrass, Well No. 1, lessor. Davis Oil Co., lessee. Location: Waters of White Oak Creek, of south fork of Kentucky River,

near Major P. O., 4½ miles south of Booneville, Owsley County, Ky.
Partial Record. Drilling dates unknown.

Strata	Thickness	Depth
PENNSYLVANIAN SYSTEM		
Soil	20	20
Shale and shells	60	80
Shale, soft caving	10	90
Sandstone	110	200
Shale	190	390
Shale	35	425
Sandstone	35	460
Shale, white	15	475
MISSISSIPPIAN SYSTEM		
Shale (pencil cave)	15	490
Limestone, (Gas 535) }	135	625
Limestone (show gas)	5	630
Limestone } "Big Lime" {	30	660
Limestone—oil and gas	2	662
Limestone, white	2	664
Limestone }	6	670
Total depth		670 feet

WELL LOG No. 5.

J. S. Rowland, No. 1, Lessor. Owsley Oil & Gas Co. and Pat. Calhoun, Lessees. Location: Owsley County, Ky. Commenced: June 20, 1918. Completed: Aug. 20, 1918.

Strata	Thickness	Depth
RECENT		
Soil	5	5
PENNSYLVANIAN SYSTEM		
Limestone shells	50	75
Limestone, sandy	15	90
Shale, brown	26	116
Shale, black	34	150
Limestone, blue	85	235
Shale, blue	45	280
Limestone, blue	20	300
Sandstone, white	65	365
Limestone	15	380
Sandstone, white	35	415
Limestone	15	430
Shale, blue	20	450
Sandstone	23	483
Shale	2	485

Strata	Thickness	Depth
Limestone	10	495
Shale, white	60	555
Shale, dark	8	563
Shale, white	21	584
Limestone, "Big Lime"	127	711
Shale, gray shells	155	865
Limestone, shells, oil and gas	5	870
Shale, gray	270	1140
DEVONIAN SYSTEM		
Shale, black	143	1283
Fire clay	4	1287
Shale	19	1306
Limestone, "Cap Rock"	2	1308
Sandstone (Corniferous, Irvine, salt water)	96	1404
Limestone, & black shale	8	1412
Total depth		1412 feet

Character of sand from 1352 to 1404 (Corniferous); Sand, hard, brown (small oil) 1352 to 1356; White, very hard 1456-1359; Brown, fine 1351-1361; Brown, hard fine 1361-1365; Pay streak (oil) 1365-1366; White, very hard, fine 1366-1369; hard, white, fairly coarse 1369-1380; Very hard, fine, white 1380-1385; brown, coarse 1385-1390; very fine, hard sand 1390-1404; Bastard formation consisting of lime and shale, black, soft, 1404 to 1412. Best shot seems to be from 1365 to 1390; if too big would advise 1365 to 1380, the latter being about a 40 qt. shot.

WELL LOG No. 6.

Tom Bowman, No. 1, Lessor. Brokaw, Garner, Dixon and McKee, Lessees. Location: On head of Little Sturgeon Creek, Owsley County, Ky. Commenced: Sept. 25, 1924. Completed: Nov. 1, 1924. Production: dry, gas.

Strata	Thickness	Depth
RECENT		
Soil	30	30
Gravel	10	40
PENNSYLVANIAN SYSTEM		
Shale, black, broken	335	375
Sandstone, white	90	465
Shale, blue	25	485
Sandstone, brown "Salt Sand"	137	622
MISSISSIPPIAN SYSTEM		
Limestone, gritty	31	653
Limestone, "Little Lime"	22	675
Shale, black	23	698

Strata	Thickness	Depth
Limestone, broken	32	730
Limestone, gray { "Big Lime"	33	763
Limestone, white	113	876
Shale, gray, "Waverly"	124	1000
DEVONIAN SYSTEM		
Shale, black, "Chattanooga"	100	1100
Shale, gray, white, black	194	1294
Shale, brown	131	1425
Shale, soft light { "Ohio Shale"	10	1435
Shale, brown	2	1437
Shale, "Fire clay"	6	1442
Shale, brown	9	1451
Limestone, "Cap Rock," "Corniferous"	3	1454
Limestone, "Gas Sand," "Corniferous"	9	1463
Limestone and shells	74	1537
Limestone, "Sand"	1	1538
Limestone and shells	4	1542
Limestone and shells, "Sand"	8	1550
Shale	2	1552
Total depth	1552 feet	

Two joint 8½" casing. 698 feet 6¼" casing—left in hole. Tested 2½. 10 inches water in the 6¼" hole. 741,000 cu. ft. O. F. C. at 1454-1463. Contractor: A. H. Davis. Drillers: C. J. Whisman and J. C. Hackenberry. Tool Dressers: Everett Snowden and Paul Kidd. Steel line measurements at 763, 1452 and 1552. Authority: Brokaw, Dixon, Garner and McKee, 120 Broadway, N. Y. City.



VIEW EASTWARD FROM ATLANTIC OIL PRODUCING CO. NO. 1
The Hudson Hill occupies the left background while the David Chadwell and Robert Morris leases are in the lower foreground.

WELL LOG No. 7.

William Gabbard, No. 1, lessor. Pyramid Oil Co., lessee. Location: One half mile N. W. of Travelers Rest, Owsley County, Ky. Commenced: May 21, 1919. Completed: June 25, 1919.

Strata	Thickness	Depth
RECENT		
Soil	7	7
PENNSYLVANIAN SYSTEM		
Shale, black	18	25
Sandstone, (85 ft. from water, hole full)	195	220
Shale and shells	60	280
MISSISSIPPIAN SYSTEM		
Limestone, "Big Lime"	135	415
Shale, "Red Rock"	30	445
Limestone, white	10	455
Shale and shells	380	835
DEVONIAN SYSTEM		
Shale, brown	125	960
Fire clay	29	989
Sandstone "Corniferous"	72	1161

Total depth 1161 feet

Casing Record: 8½", 24 lb., 7 feet; 6¼", 13 lb., 345 feet.

Note: Sand very hard; drilled 4 feet every two hours.

WELL LOG No. 8.

Thomas & Allen Lynch, Well No. 1, lessor. Pyramid Oil Co., lessee. Location: One mile S. W. of Travelers Rest, Owsley County, Ky. Commenced: July 19, 1919. Completed: August 11, 1919.

Strata	Thickness	Depth
RECENT		
Soil	8	8
PENNSYLVANIAN SYSTEM		
Shale and shells	67	75
Sandstone (90 hole full)	100	175
Shale and shells	85	260
Sandstone	140	400
Shale and shells	25	425
MISSISSIPPIAN SYSTEM		
Limestone, "Big Lime"	120	545
Shale, "Red Rock"	21	556
Limestone	29	585
Shale and shells	375	960

Strata	Thickness	Depth
DEVONIAN SYSTEM		
Shale, brown "Chattanooga"	122	1082
Clay, soft	17	1099
Limestone, "Corniferous"	86	1185
Total depth		1185 feet.
Depth at which oil was found	1155	5—1160
Depth at which gas was found	1100	9—1109
Casing Record:	8½", 24 lb., 8 feet; 6¼", 13 lb., 425 feet.	

WELL LOG No. 9

Walter Gibson, No. 1, lessor. Eastern Gulf Oil Co., Lexington, Ky., lessee. Location: On waters of Bear Run of Cow Creek, Owsley County, Ky.. Commenced: May 26, 1924. Completed: June 18, 1924. Contractor: C. E. Dearolph.

Strata	Thickness	Depth
RECENT		
Soil	5	5
PENNSYLVANIAN SYSTEM		
Shale	10	15
Shale, shelly, water	20	35
Coal	2	37
Limestone	3	40
Shale	20	60
Limestone, broken	90	150
Limestone, hard	5	155
Limestone, broken	55	210
Sandstone	60	270
Shale	50	320
Limestone, white	20	340
Limestone and shale, broken	10	350
Sandstone, sharp	205	555
Shale, black	65	620
MISSISSIPPIAN SYSTEM		
Limestone—casing point, 6½ in.	5	625
Shale, black	35	660
Limestone, "Big Lime," hard	140	800
Shale and shells	90	890
Shale, red	20	910
Shale	310	1220
DEVONIAN SYSTEM		
Shale, brown, "Chattanooga"	190	1410
Shale, "Fire Clay"	2	1412
Shale	18	1430

Strata	Thickness	Depth
Limestone, "Corniferous" oil show	11	1441
Limestone, brown, "sand"	8	1448
Limestone, "Corniferous"	64	1512
Limestone, "Sand," "Corniferous"	3	1515
Total depth		1515 feet

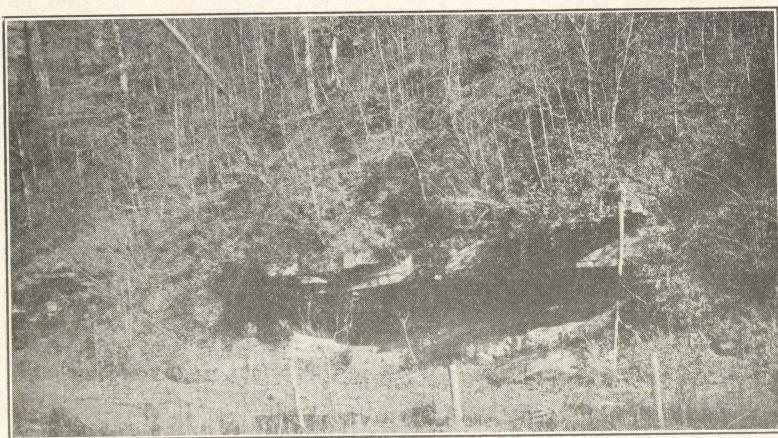
Show of oil, salt water 250 ft., filled up 500 feet. 30 minutes—filled up 1,250 feet. 2 hours. Plugged and abandoned. 8½" casing 20 feet. 6½" casing 625 feet.

WELL LOG No. 10.

Location: Below Roans Branch of Buffalo Creek, near Clay-Owsley County line. One-half mile from Creek on North Side. Completed in 1918.

Strata	Thickness	Depth
RECENT		
Clay	5	5
PENNSYLVANIAN SYSTEM		
Shale	21	26
Sandstone	44	70
Shale	30	100
Shale, shelly	110	210
Sandstone	240	450
Shale	25	475
MISSISSIPPIAN SYSTEM		
Limestone, "Little Lime"	15	490
Shale	10	500
Limestone, "Big Lime"	120	620
Shale	10	630
Limestone	25	655
Sandstone	15	670
Shale, white, shelly	170	840
Shale, dark, shelly	280	1120
DEVONIAN SYSTEM		
Shale, black	163	1283
Shale, white	3	1286
Shale, brown	23	1309
Limestone	8	1317
Limestone "Sand"	3	1320
Total depth		1320 feet

Note: Oil pay was struck at 1,317 feet in depth. This record revised from p. 471, Oil and Gas Resources of Kentucky. Ky. Geol. Survey, Bull. 1, Ser. V, 1920.



ISLAND CREEK ANTICLINE

Pronounced dips such as that to the northeast shown above near the Brewer-Peters line, are to be seen in the surface rocks on the anticlinal structure plunging across Upper Island Creek.

LOG WELL No. 11.

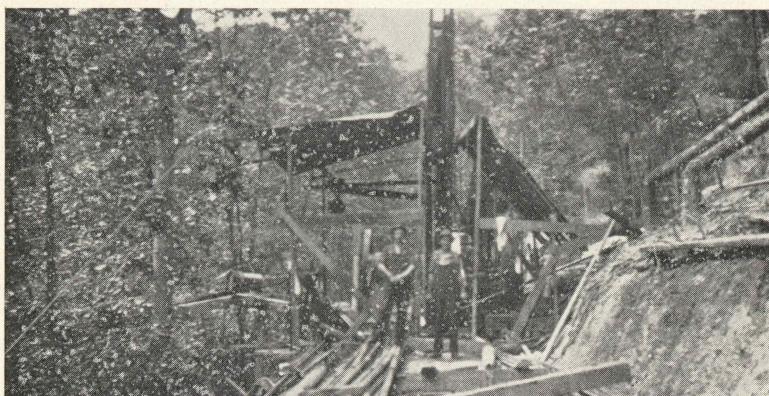
J. S. Burns, No. 1, Lessor. Superior Oil Corporation, Lessee. Location: 150' N. E. of Creek, 150' from S. line of J. S. Burns which is N. line of Morris farm, Owsley County, Ky. Commenced: July 30, 1925. Completed: Jan. 5, 1926.

Strata	Thickness	Depth
RECENT		
Soil	20	20
PENNSYLVANIAN SYSTEM		
Shale, sandy	25	45
Sandstone, white	15	60
Coal	5	65
Limestone, gray	20	85
Coal	3	88
Shale, sandy	17	105
Sandstone, white	35	140
Shale, blue	15	155
Shale, hard, sandy	125	280
Shale, black	30	310
Shale, hard, sandy	70	380
Shale, shelly—set 445' 8" pipe	65	445
Sandstone, white	65	510
Shale, blue	75	585
Shale, sandy	110	695
Shale, blue	5	700
Sandstone, white	129	829

Strata	Thickness	Depth
Shale, green	2	831
Shale, sandy	14	845
Shale, blue	15	860
Shale, sandy	60	920
Shale, blue	20	940
Shale, black, very hard	3	943
MISSISSIPPIAN SYSTEM		
Shale, blue	17	960
Limestone, dark	10	970
Limestone, shelly	45	1015
Shale, dark	15	1030
Limestone, black, set 1044', 6 1/4 casing	28	1058
Sandstone, light—"pay sand"	9	1074
Sandstone, dark—show of oil		
Sandstone, light	12	1086
Sandstone, dark	23	1109
Shale	5	1114
Sandstone, light	16	1130
Shale	4	1134
Limestone, dark	9	1143
Limestone, white	7	1150
Limestone, dark	8	1158
Limestone, dark	82	1240
Shale, blue, "New Providence"	350	1590
DEVONIAN SYSTEM		
Shale, black	211	1801
Shale, green	10	1811
Shale, black	6	1817
Limestone, dark gray	11	1828
Limestone, white	1	1829
Limestone, black	7	1836
Limestone, gray	12	1848
Limestone, black	15	1863
Limestone, gray	3	1866
SILURIAN SYSTEM		
Limestone, black	34	1900
Limestone, gray	35	1935
Shale, green	7	1942
Total depth	,	1942 feet

WELL LOG No. 12.

Chester Gourlay, lessor. Petroleum Exploration, lessee. Location: On waters of Sturgeon Creek $\frac{1}{2}$ mile east of the mouth of Wild Dog Creek, on top of hill. Commenced: —. Completed:



PETROLEUM EXPLORATION, INC., WELL NO. 1

This well located well upon the ridge on the J. F. Brewer lease flowed when flush August 6, 1927.

May 16, 1924. Drilled and owned by the Petroleum Exploration of Sistersville, W. Va.

Strata	Thickness	Depth
PENNSYLVANIAN SYSTEM		
Soil	12	12
Shale, sandstone, shells	328	440
MISSISSIPPIAN SYSTEM		
Limestone, "Big Lime"	130	570
Shale, blue, soapstone	454	1024
DEVONIAN SYSTEM		
Shale, black, "Chattanooga"	120	1144
Shale, "Fire Clay"	6	1150
Shale, dark	4	1154
Sandstone	6	1160
Sandstone, "gas sand"	12	1172
Limestone, blue	12	1184
Total depth		1184 feet

Gas tested after completion 1,300,000 cu. ft. Rock pressure 240 lbs. 570 feet 6 $\frac{1}{2}$ inches casing.

WELL LOG No. 13.

Well drilled for oil and gas. Location: 2 $\frac{1}{2}$ miles N. W. of Booneville, Owsley County. Commenced: Completed: Production: Reputed to be 35 bbls. oil.

Strata	Thickness	Depth
RECENT		
Soil	5	5

Strata	Thickness	Depth
PENNSYLVANIAN SYSTEM		
Sandstone, hard, gray	7	12
Shale and shells	5	17
Coal	3	20
Shale, gray	35	55
Coal	2	57
Shale, blue	43	100
Coal and gas	3	103
Shale, blue	37	140
Sandstone	10	150
Shale, blue	8	158
Coal	4	164
Sandstone, white	25	187
Shale, black	28	215
Sandstone, white	40	255
Sandstone, gray, white	40	295
Shale, black, water	10	305
Sandstone, gray	20	325
Sandstone, white	120	445
Shale, "Fire Clay"	5	450
Shale, gray	15	465
MISSISSIPPIAN SYSTEM		
Limestone, gray, "Little Lime"	34	499
Shale, dark	13	502
Limestone, "Big Lime"	130	632
Shale, green	12	644
Shale, "Red Rock"	22	666
Shale, green	9	675
Shale, "Red Rock"	72	747
Shale, green	35	782
Limestone, shelly	17	799
Shale, gray	306	1105
DEVONIAN SYSTEM		
Shale, brown, "Chattanooga"	146	1251
Shale, soft, "Fire Clay"	18	1260
Shale, brown	5	1274
Limestone, "pay sand". } "Corniferous" {	7	1290
Limestone	9	1283
Limestone	11	1301
Total depth		1301 feet

Note:—Set casing at 474 feet.

WELL LOG No. 14.

Dean Heirs No. 1, Lessor. Rex-Pyramid and Henry Co., Lessees. Location: 1 $\frac{1}{2}$ miles up Rattlesnake Branch of Upper Buffalo Creek,

Owsley County, Ky. Incompleted record. Driller, Frank Henry, Frankfort, Ky.

Strata	Thickness	Depth
RECENT		

Soil and gravel	9	9
PENNSYLVANIAN SYSTEM		
Coal	1	10
Limestone, sandy, gray-hole full fresh water	22	32
Limestone, black	55	87
Shale, blue and mud	78	165
Shale, sandy, blue	30	195
Shale, black—cased 8½" at 205'	35	230
Shale, brown, sandy, show of gas	1	231
Shale, black	10	241
Sandstone, hard, gray	9	250
Shale, sandy—gas at 380 ft.	140	390
Limestone, black	8	398
Shale, blue, hard	87	485
Shale, black	20	505
Sandstone, gray—250 ft. fresh water at 510 ft.	17	522
Shale, light blue	23	545
Shale, sandy	15	560
Sandstone, hard	8	568
Limestone, black	7	575
Sandstone	35	610
Shale, sandy, black	52	662
Sandstone, white	87	749
Coal	1	750
Shale, sandy, black, hard	27	777
Shale, sandy, gary, hard	6	783
Shale, black and mud	5	788
Shale, black, hard	15	803
Sandstone, white, hard	134	937
Shale	10	947
Limestone, broken	10	957
Shale, red and mud	6	963
Limestone, black, very hard	4	967
Shale, and mud	13	980
Sandstone, white	55	1035
Sandstone, "Salt Sand"	10	1045
Sandstone, blue	10	1055
Shale, and mud—Cased 6½" casing at 1057'	2	1057
MISSISSIPPIAN SYSTEM		
Limestone, black	9	1066
Shale, limey	4	1070

Strata	Thickness	Depth
Shale, black	9	1079
Limestone, sandy, gray	15	1094
Shale, black	17	1111
Limestone, black	34	1145
Limestone, brown, sandy, very hard—show of oil at 1160. Should have gotten the Buffalo sand here	41	1186
Shale, pea green, and pyrites	10	1196
Limestone, brown	10	1206
Limestone, gray	7	1213
Limestone, brown, dark	15	1228
Limestone, light brown	30	1258
Limestone, dark brown	20	1278
Limestone, light brown	15	1293
Limestone, dark brown	53	1346
Limestone, very dark brown	14	1360
Limestone, sandy, dark brown, good show of gas (Big Injun Sand"?)	10	1370
Shale, blue	12	1382
Shale, blue and Red Rock	15	1397
Shale, blue	45	1442
Shale, blue and Red Rock	15	1457
Shale, blue—"New Providence"	228	1685

DEVONIAN SYSTEM

Shale, black—"Chattanooga"	150	1835
Fire clay	8	1843
Shale, black	27	1870
Limestone, sandy, brown	15	1885
Limestone, dark gray	18	1903
Limestone, sandy, dark brown	5	1908
Sandstone, dark brown (sharp)—gas at 1908	22	1930
Sandstone, light brown	7	1937
Limestone, dark brown	23	1960
Limestone, sandy, gray	2	1962

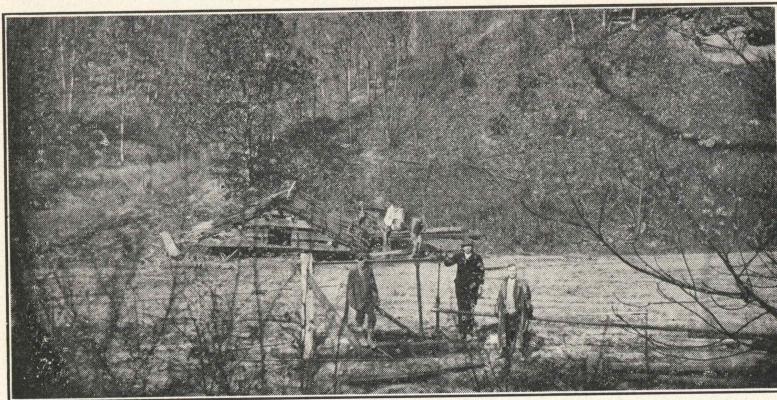
Still drilling Nov. 15, 1926.

WELL LOG No. 15.

JACKSON COUNTY

E. G. Bowles, No. 1, lessor. Young Gasoline and Refining Company, lessee. Contractor: —— Drake. Location: $\frac{3}{4}$ mile S. E. of Mauldin P. O., Jackson County, Ky.

Strata	Thickness	Depth
RECENT		
Surface	5	5



THE DISCOVERY WELL

The view is taken from the hillside and shows the J. F. Brewer No. 1 well in the bottom of Oil Branch below. F. M. Ashley, the driller, and William Moore, the tool dresser, stand at the left of V. S. Beatty, who with Messrs. McGuire and Pollard are the principal owners of the new well and leasehold.

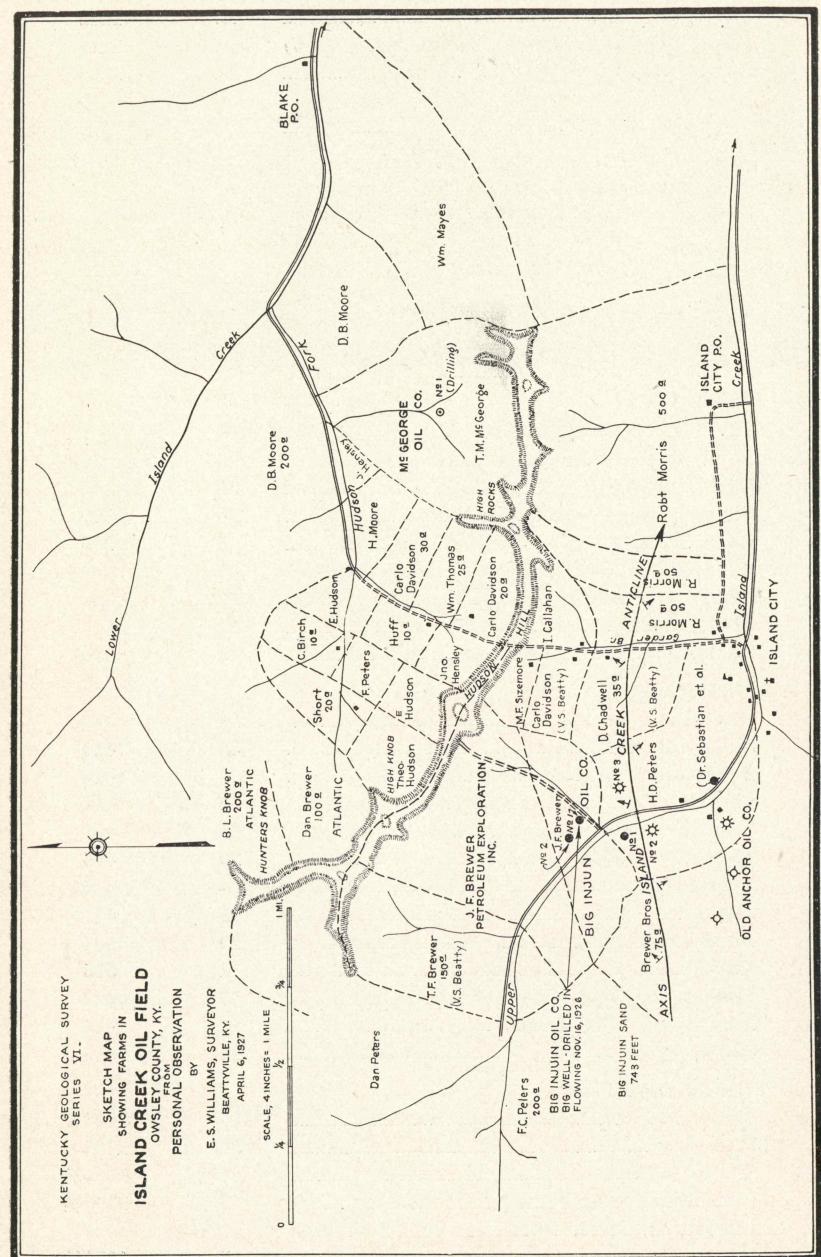
Strata	Thickness	Depth
PENNSYLVANIAN SYSTEM		
Shale	5	10
Sandstone	25	35
Shale	5	40
Sandstone	20	60
Coal	2	62
Shale	63	125
Sandstone	225	350
Shale, pink	10	360
Sandstone "Conglomerate"	15	375
Sandstone, gray	25	400
MISSISSIPPIAN SYSTEM		
Limestone	15	415
Sandstone	20	435
Shale	5	440
Limestone } {	25	465
Shale } "Big Lime" {	20	485
Limestone Cased 6 1/4	36	521
Limestone } {	79	600
Sandstone, "Big Injun"	10	610
Shale and shells—show of oil	125	735
Shale	265	1000
DEVONIAN SYSTEM		
Shale, brown, "Chattanooga"	120	1120
Clay, soft	10	1130

Strata	Thickness	Depth
Shale, brown	12	1142
Limestone, "Corniferous" (salt water 1149)	7	1149
Limestone, "Corniferous"	11	1160
Total depth		1160 feet

WELL LOG No. 16.

Jose Wilson, No. 1, lessor. Rex-Pyramid Oil Co., and L. C. Young, lessees. Location: On Sturgeon Creek, $\frac{3}{4}$ mile north of Nathanton, Jackson County, Ky. Contractor: T. H. Drake.

Strata	Thickness	Depth
RECENT		
Soil	5	5
Shale, blue	25	30
PENNSYLVANIAN SYSTEM		
Sandstone—water	5	35
Shale, brown	15	50
Shale, sandy—water	180	230
Coal	5	235
Sandstone, "Conglomerate"	45	280
Sandstone, white	80	360
Shale, dark	15	375
Shale, soft	5	380
MISSISSIPPIAN SYSTEM		
Limestone	10	390
Shale, dark	30	420
Sandstone—oil	6	426
Shale	9	435
Limestone	10	445
Limestone, soft	20	465
Sandstone	5	470
Shale	5	475
Limestone, light	29	504
Shale	1	505
Limestone, "Big Lime"—6 1/4" casing	18	523
Limestone, "Big Lime"	87	610
Shale, gray	300	910
DEVONIAN SYSTEM		
Shale, brown	115	1025
Fire Clay	30	1155
Shale (coffee)	9 1/2	1164 1/2
Limestone, "Cap rock," hard and dry	5	1169 1/2
Limestone, hard, filled to 60' with salt water	5	1174 1/2



Strata	Thickness	Depth
Limestone, hard	5½	1180
Limestone, hard and fine	4	1184
Limestone, hard	11	1195
Total depth		1195 feet

WELL LOG No. 17.

OWSLEY COUNTY

Same Moore, No. 1. Eastern Gulf Oil Co., lessee. Location: Moore Fork, head of Meadow Creek, N. E. part of Owsley County, Ky. Commenced: Jan. 4, 1927. Completed: Mar. 11, 1927.

Strata	Thickness	Depth
RECENT		
Soil	5	5
PENNSYLVANIAN SYSTEM		
Cavey conglomerate	20	25
Shale, dark	20	45
Coal	2	47
Shale and shells, set 70' 10"	23	70
Limestone	10	80
Shale, black and shells	90	170
Shale, blue	80	250
Sandstone	20	270
Shale and shells	95	365
Sandstone	106	471
Shale—mud	1	472
Sandstone	113	585
Shale and shells	50	635
MISSISSIPPIAN SYSTEM		
Limestone	15	650
Shale, blue and shells	50	700
Limestone, "Big Lime"	100	800
Shale, green	6	806
Sandstone "Big Injun"	58	864
Shale, blue	411	1275
DEVONIAN SYSTEM		
Shale, black, "Chattanooga"	180	1455
Clay, soft	12	1467
Shale, "Coffee"	13	1480
Limestone, "Corniferous"	146	1626
Shale, green—mud	3	1629

Total depth 1629 feet

From 365 to 471, lower part settling sand.
Set 719 feet of 8¼" pipe.

Note: Light showing of oil from 1539 to 1540. Salt water 1543 to 1546—filled up 150 feet. Came in slowly and bailed down easily. Water gradually increased from sand 1546 to 1550½ feet—filled up 250 feet. Heavy water struck from 1594 to 1598½—filled up to 900 feet.

WELL LOG No. 18.

CLAY COUNTY

John Meade No. 1, lessor. National Refining Co., lessee. Location: Lower Teges, Clay County, Ky. Commenced: Sept., 1925. Completed: Nov., 1925. Drilled by H. O. Randel. Hole dry, plugged, pulled and abandoned. A small amount of gas in the bottom of the "Big Lime." The showings of oil were just rainbows and it is doubtful if it came from the sand or from the bucket in which the sample was washed out, as it showed grease around the edge which looked to me like some machine oil had been put into the bucket at some time while being used around the rig.

Strata	Thickness	Depth
RECENT		
Soil, yellow	3	3
PENNSYLVANIAN SYSTEM		
Sandstone, gray	27	37
Shale, blue	30	67
Sandstone, gray	3	70
Shale, blue	6	76
Sandstone, gray	3	79
Shale, blue	10	89
Sandstone, gray	5	94
Shale, blue	61	155
Sandstone, gray	4	159
Shale, blue	7	166
Sandstone, gray	3	169
Shale, blue	6	175
Sandstone, gray	82	257
Shale, black	10	267
Sandstone, gray	144	411
Shale, blue	49	460
Limestone, black	7	467
Shale, blue	73	540
MISSISSIPPIAN SYSTEM		
Limestone, black	6	546
Shale, blue	14	560
Limestone, "Little Lime," black.....	12	572
Limestone, gray, "Little Lime"	17	589
Limestone, black	6	595

Strata	Thickness	Depth
Limestone, gray, "Big Lime"	230	825
Shale, white	10	835
Shale, green	20	855
Shale, red	54	909
Shale, gray	61	970
Limestone, gray	3	973
Shale, gray	20	993
Limestone, gray	2	995
Shale, gray	135	1130

DEVONIAN SYSTEM

Shale, brown	136	1266
Shale, gray	11	1277
Shale, black	8	1285
Limestone, gray	9	1294
Limestone, gray	5	1299
Limestone, black	9	1308
Limestone, dark gray, oil show.....	4	1312
Limestone, gray	8	1320
Limestone, gray, oil show	5	1325

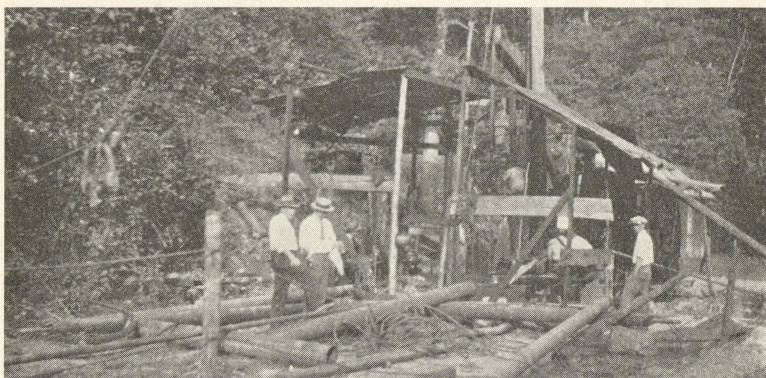
SILURIAN SYSTEM

Limestone, gray	4	1329
Limestone, black	5	1334
Limestone, black H. H.	13	1347
Limestone, L. gray, sandy.....	19	1366
Shale, gray	15	1381
Shale, gray	124	1505
Shale, red	45	1550
Shale, gray	45	1595
Limestone, blue	48	1643
Shale, gray	9	1652
Limestone, blue	65	1717
Limestone, black H. H.	15	1732
Shale, black	10	1742
Total depth		1742 feet

WELL LOG No. 19.

Mobray Robinson, lessor. Petroleum Exploration, lessee. Location: Near Cradle Bow, Clay County, Ky. Commenced: Sept. 1, 1924. Completed: Nov. 18, 1924. Contractor: C. E. Dearolph. Drillers: F. D. Coon and F. W. Wade. Dry hole.

Strata	Thickness	Depth
RECENT		
Soil	4	4



J. F. BREWER NO. 3 WELL.

This drilling by the Big Injun Oil Co. came in a good oil well August 9, 1927. See analysis attached to this report.

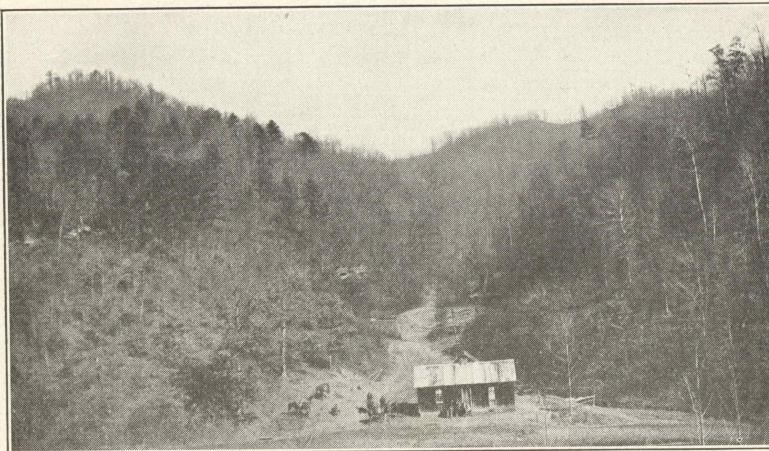
Strata	Thickness	Depth
PENNSYLVANIAN SYSTEM		
Shale and shells	26	30
Shale	40	70
Coal	4	74
Shale	16	90
Limestone, shelly	25	115
Shale and shells	205	320
Sandstone, little gas at 330	245	565
Shale	10	575
MISSISSIPPIAN SYSTEM		
Shale, sandy, "Red Rock"	6	581
Limestone, shelly	10	591
Shale	10	601
Shale, sandy "Red Rock"	25	626
Shale, sandy	88	714
Limestone	11	725
Shale	15	740
Limestone, "Big Lime"	115	855
Shale, green	50	905
Shale, sandy "Red Rock"	5	910
Shale	20	930
Shale, sandy "Red Rock"	10	940
Shale	350	1290
DEVONIAN SYSTEM		
Shale, black, gas at 1,345	150	1440
Shale, "Fire Clay" "Chattanooga"	5	1445
Shale, black	7	1452

Strata	Thickness	Depth
Limestone, "Corniferous," gas at 1,475	60	1512
Shale, blue	18	1530
Total depth		1530 feet
10" casing 35'. Left in hole 19 ft. 6½" casing, X 17 lb., 814, all pulled out. Gas 1,345. Gas 1,475. Authority: Petroleum Exploration.		

WELL LOG No. 20.

Lee Chesmet No. 1, lessor. ———, lessee. Location: One and one-half miles northeast of Burning Spring, Sexton Creek, Clay County, Ky., near Chesmetburg P. O. C. R. Dulin, operator. Commenced: Jan. 7, 1925. Completed: ———. Nothing encountered but a show of gas on top of sand.

Strata	Thickness	Depth
RECENT		
Soil	4	4
PENNSYLVANIAN SYSTEM		
Shale	6	10
Sandstone and shale	130	140
Sandstone (mountain)	10	150
Shale	50	200
Sandstone	47	247
Shale	10	257
Sandstone	20	277
Shale	28	305
Sandstone	104	409
Shale	9	428
MISSISSIPPIAN SYSTEM		
Limestone	7	435
Shale, "Red Rock"	5	440
Shale, lime shells	107	547
Limestone	10	557
Shale, and lime shells	15	572
Limestone	171	743
Sandstone, "Big Injun"	55	798
Shale, light	327	1125
DEVONIAN SYSTEM		
Shale, black "Chattanooga"	127	1252
Shale, black	27	1279
Limestone, "Sand," "Corniferous"	30	1309
Total depth		1309 feet



TOPOGRAPHY OF BREWER TRACT, ISLAND CREEK

The region is a maturely dissected plateau with narrow winding forested ridges and slopes. The valley bottoms are meandering and exhibit a well developed low gradient.

WELL LOG No. 21.

OWSLEY COUNTY

Thomas McGeorge, No. 1, lessor. McGeorge Oil Co. (Wm. Porter, et al., Beattyville, Ky.), lessees. Location: On waters of Lower Island Creek, in Central Owsley County, Ky. Drilled: April, 1927.

Strata	Thickness	Depth
RECENT		
Soil	16	16
PENNSYLVANIAN SYSTEM		
Shale	19	35
Sandstone	10	45
Shale, blue	15	60
Sandstone, hard	10	70
Shale, blue	165	235
Limestone, gray	80	315
Shale, blue	10	325
Shale, gray	20	345
Sandstone	105	450
Coal	6	456
Shale	7	463
Sandstone	85	548
Shale	2	550
Sandstone	30	580
Coal	2	582
Shale	18	600

Strata	Thickness	Depth
Sandstone, shelly	25	625
Shale	12	637
Shale	28	665
MISSISSIPPIAN SYSTEM		
Limestone, "Little Lime"	20	685
Shale	20	705
Limestone, "Big Lime"	170	875
Limestone, "Keener Sand"	25	900
Shale, green	15	915
Shale, gray	355	1270
DEVONIAN SYSTEM		
Shale, brown, "Chattanooga"	136	1406
Fireclay	12	1418
Shale, "coffee"	12	1430
(Show of gas)		
Limestone—"Irvine Sand"	11	1441
(Show of oil)		
Limestone, "Irvine Sand"	109	1550
Total depth		1550 feet
Authority: Wm. Porter.		

WELL LOG No. 22.

J. F. Brewer No. 2, lessor. Big Injun Oil Co., lessee. Location: 300 feet northwest of J. F. Brewer No. 1, Owsley County, Ky. C. H. E. estimated to be 24 feet higher than No. 1. Flush and flowing July 2nd, 1927. Production oil, 6 bbls. flowing per hour. Authority: Judge Pollard.

Strata	Thickness	Depth
RECENT		
Soil (drive pipe)	16	16
PENNSYLVANIAN SYSTEM		
Limestone, shelly	8	24
Shale	126	150
Sandstone, white	35	185
Sandstone, brown	35	220
Shale	15	235
Sandstone, "Salt sand"	155	390
Shale, black	25	415
Sandstone, gray	10	425
Shale, gray	5	430
Sandstone, white	70	500
Shale, black, hard	12	512
Shale, black	14	526
Limestone, brown	14	540

Strata	Thickness	Depth
MISSISSIPPIAN SYSTEM		
Shale and limestone, shelly	30	570
Sandstone, gray	15	585
Shale, limestone, shelly	60	645
Limestone, "Little Lime"	18	663
Shale, white	2	665
Limestone, "Big Lime" (Casing 667½).....	24	689
"Sand" producing oil		690
Total depth		690 feet

WELL LOG No. 23.

J. F. Brewer No. 3, lessor. Big Injun Oil Co., lessee. Location: Just above mouth of Oil Branch of Upper Island Creek, Owsley County, Ky. Completed: Aug. 9th, 1927. Production: 50 bbls. oil. Driller: Milt Ashley.

(Incomplete record.)

Strata	Thickness	Depth
RECENT		
Soil	8	8
PENNSYLVANIAN SYSTEM		
Sand	8	16
Shale, black	104	120
Sandstone, white	30	150
Shale	70	220
Sandstone, "Salt Sand"	80	300
Shale and limestone, shelly	45	345
Sandstone, "Salt Sand"	105	450
Shale	20	470
MISSISSIPPIAN SYSTEM		
Limestone	15	485
Shale and limestone, shelly	40	525
Limestone, sandy	13	538
Sandstone, white	14	552
Limestone, black	10	562
Limestone, red	6	568
Limestone, black	12	580
Shale, black	20	600
Limestone, black	23	623
Limestone, "Big Lime," setting casing at 626, gas 657	34	657

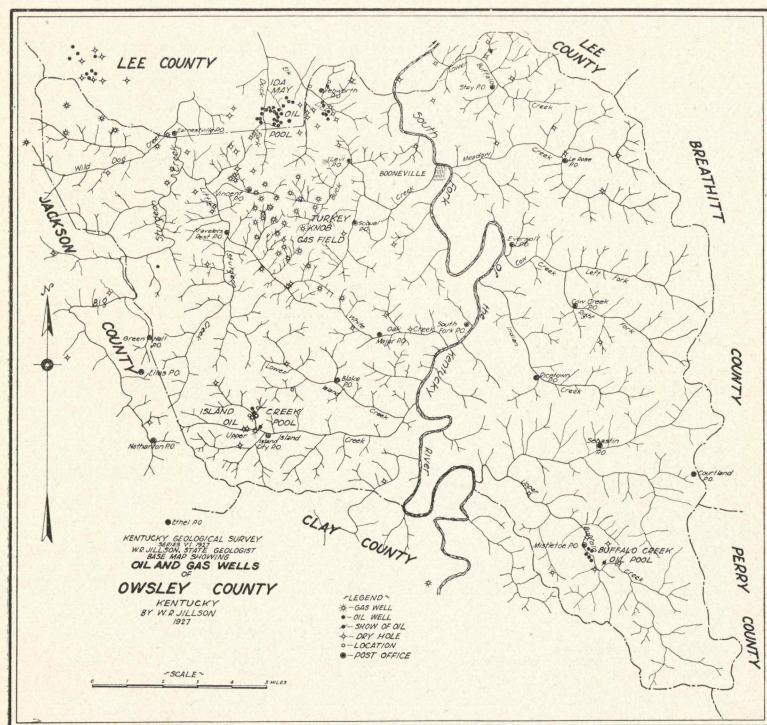
Authority: George H. Schroer, Field Manager.

WELL LOG No. 24.

J. F. Brewer No. 1, lessor. Petroleum Exploration, Inc., lessee. Location: One hundred feet north of No. 2 well on same farm and property of Big Injun Oil Co., on Oil Branch of Upper Island Creek, Owsley Co., Ky. Commenced: _____. Completed Aug. 6, 1927. Production: 12 bbls. first 10 minutes then closed in by driller.

Strata	Thickness	Depth
RECENT		
Surface	15	15
PENNSYLVANIA SYSTEM		
Sandstone	10	25
Shale	175	200
Sandstone	25	225
Shale	125	350
Sandstone	140	490
Shale	15	505
Sandstone	85	590
Shale	10	600
MISSISSIPPIAN SYSTEM		
Limestone, black	75	675
Shale	6	681
Limestone, black	9	700
Shale	15	715
Limestone, "Big Lime"	25	740
Shale, black	2	742
Limestone, "Big Lime"	58	800
Shale, "Pencil Cave"	1	801
Limestone, brown, sandy	18	819
Limestone, brown, sandy, oil	12	831
Limestone, hard and soft, sandy (no oil)....	16	847
Shale, green and sandstone	1	848
Total depth		848 feet

16 feet conductor pipe, 723 ft. 6 1/4 in. casing. Well flowed within 5 minutes after finding pay at 819 feet. It was reported to be making 125 barrels of oil daily on Aug. 20, 1927. The logged record given above is one of the best that the Island Creek field has produced.



OIL AND GAS POOLS OF OWSLEY CO., KY.

OIL AND GAS SANDS

The principal oil and gas sand in Southwestern Owsley County, Kentucky up until the discovery of the J. F. Brewer H. D. Peters wells was the "Corniferous," "Irvine" or "Big Sinking" sand. On Island Creek it is found at about 1,250 or 1,350 feet depending upon location. This oil and gas formation is a silicious or cherty limestone on the outcrop, somewhat magnesian or dolomitic in producing areas. It is a correlative in part at least of the Onondagan of New York and therefore of Middle Devonian age. Its lithology in those areas where it has been drilled varies from very hard and dense to very soft and porous. Important productive localities in the "Corniferous" sand generally exhibit the latter characteristic, but all gradations are recognized by the driller. Shortly following deposition this formation was subjected to deformation and erosion. Good ex-

amples of the former are to be seen at Irvine, and of the latter at Locust Grove postoffice in Southern Estill County, Kentucky.

At this latter locality although excellent structure at the surface was found and drilled, the "Irvine sand" was missing entirely. Such and similar sedimentary, lithological and deformational conditions as are found in the oil and gas producing areas of Estill, Lee, Powell, and Wolfe Counties on the north must be expected to continue southwestward along the strike into Owsley and Jackson Counties. The "Irvine sand" produced the "Irvine," "Ravenna," "Ross Creek" and "Station Camp" pools in Estill; the "Ashley" in Powell; the "Campton" in Wolfe; and the "Big Sinking" oil pool in Lee County. In Southern Lee and Northern Owsley it gave the "Ida May" and "Pebworth" oil pools. The Turkey Knob Gas field a few miles west of Boonville in Owsley County produces from this extraordinary horizon. At some undefined point southwest of this large gas field this sand at the base of the Kentucky Devonian will probably produce another important oil pool following adequate exploratory drilling.

Within recent times, however, operators interested in the oil and gas development of Southern Owsley County have come to recognize two new and important producing "Sands" in this region in the Upper and Middle Mississippian sediments. The shallowest of these is the "Mistletoe" sand producing on the waters of Upper Buffalo Creek. It is an oolitic limestone and is probably to be correlated with the Gasper (Chester). In 1925 this sand—not previously known to be of commercial importance as an oil producer in Kentucky—produced more than 5,000 barrels of petroleum.

Somewhat lower the "Island Creek Sand" occurring near the base of or just below the "Big Lime" has now become of commercial importance and must henceforth receive careful consideration in all proposed drillings in this general district of Kentucky. Drillers operating in this field have identified this oil and gas sand found at about 750 feet as the "Big Injun." No drill cutting samples have been available for optical or chemical examination up to the present writing, so identifications must now be passed. This will come certainly later. In the meantime in that broad territory comprising Southwestern Owsley,

Eastern Jackson and Northeastern Clay County the "Brewer" or "Island Creek" is a "sand" of great importance, offering evidently in certain locations unusually prolific oil and gas production.



THE J. F. BREWER NO. 2 WELL

This well produced at 690 feet and flowed according to report about 6 barrels an hour July 2, 1927.

GENERAL CONDITIONS

Owsley County adjoins Lee on the South in which the largest oil pool in Kentucky was developed a few years ago, in the "Big Sinking" district. Lee County, Kentucky produced 23,279,193.95 barrels of oil valued at \$59,434,200.18 from 1919 to 1925 inclusive. The strike of the bedded rocks in the "Big Sinking" district continues along rather favorable structural lines into Southwestern Lee, Western Owsley, and Southeastern Jackson Counties. A number of indexing wells in this region of good character and productivity have been drilled. On the waters of Upper Buffalo Creek in Southeastern Owsley County, the waters of Elk Lick, Duck Fork in Southern Lee and Northern Owsley Counties, small but important oil pools have been produced.

Centering about Turkey Knob a few miles west of Booneville, a gas field of considerable extent has been developed, on the waters of Sturgeon creek centering about Traveler's Rest and Vincent postoffices. The large number of small oil and gas wells which have been drilled at various points in southern Lee,

Owsley, Jackson and northern Clay Counties, indicate that this territory generally is one in which favorable structure adequately explorated may be expected to produce oil and gas in commercial quantities.

These conditions coupled with medium drilling depths, well known drilling sections, and adequate pipe lines, have aroused an increasingly good opinion among oil and gas operators for western Owsley County and adjacent portions of Jackson County. The Island Creek pool, located in this section, gives promise of fulfilling the opinion of many operators concerning this general district in Eastern Kentucky. It is probable that other pools of smaller size will be located here during the next few years. The principal producing "sands" will probably be those associated with the Upper and Middle Mississippian, the "Big Lime," the "Big Injun" and the "Middle Devonian," the well known "Corniferous" or "Big Sinking" sand.

CONCLUSIONS

A summary of the general geological and oil producing conditions existent in the Island Creek Pool indicates a rather favorable outlook for the future development of this region, based upon the following considerations:

1. Shallow drilling: Oil in commercial quantity and quality has been secured from the "Big Injun" or adjacent sands in creek bottom locations at depths ranging from 690 to 743 feet.
2. Open sands and flowing wells: Close-in production may be prolific as indicated by the gusher qualities of the J. F. Brewer No. 1 well. The unusual natural production of this sand indicates a very porous "sand" at least for restricted localities.
3. Adequate pipe line: Connections are now assured as a result of the official ten day test by the Cumberland Pipe Line Company of J. F. Brewer No. 1. A pipe line is now extended into this field and is making regular oil runs.
4. Ease of operation in this field is possible due to the fact that it is only 20 miles removed to the southwest from the "Big Sinking" Oil Pool in Lee County, Kentucky. All necessary supplies, both men and materials, are therefore readily available in any quantity or description.

5. Good maps covering drainage, topography and structural geology are available from the Kentucky Geological Survey, allowing a thorough inspection of the geology and physiography of the region.

6. The northeast and easterly trend of the structure has been discerned by all operators and scouts investigating this field. Promise of much development in this direction is indicated by several new adjacent and nearby locations.

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Manuscript completed March 1, 1927.

Manuscript enlarged to include drillings, production and geological data of recent acquisition, August 10, 1927.